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10/698,044	10/30/2003	Yiqing Liang		1168

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EXAMINER	
AZARIAN, SEYED H	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/698,044	LIANG ET AL.	
	Examiner	Art Unit	
	Seyed Azarian	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 March 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *11,13 and 18* is/are allowed.

6)☒ Claim(s) *1-10,12,14-17 and 19-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/14/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

RESPONSE TO AMENDMENT

1. Applicant's arguments filed, 3/14/2006, see page 2 through page 14 of the remarks, with respect to the rejection of claims 1-10, 12, 14-17 and 19-55 under 103(a) has been fully considered but they are not persuasive.

Regarding claim 1, applicant argues in essence that Maki does not teach a computer configured to "characterize activity of said animal".

Contrary to the applicant's assertion, the examiner disagrees and indicates refer to column 24, line 63 through column 25, line11, described the motion of the object automatically or acquire information on the "position of the object or on the change of the posture refer to activity", on the basis of the time-series images, and posture information detector 303, tracks the motion of the object automatically according to the position of the feature points. Furthermore column 32, lines 56-67, refer to target object and configured to determine pixels corresponding, and position and posture of target, and finally column 27, lines 20-31, refer to comparison section then evaluates the various postures according to the similarity of the generated images to the image of the target object and estimates the posture on the basis of the evaluation.

Applicant argues in essence that neither references discloses "predetermined behaviors based on an analysis of changes in position or shape".

With respect to applicant's argument examiner disagrees and indicates Maki discloses (column 18, line 62 through column 19, line 4on the basis of the

difference between the central point at one time and that at another time, it is possible to determine information on the three-dimensional motion of the object between frames that is changes in the position of the posture of the object, but does not explicitly state, "one of a set of predetermined behaviors based on an analysis of changes in position or shape". On the other hand Baba teaches (column 2, lines 42-54, a television camera for taking an image of a predetermined area of the basin and a processor for processing the image taken by the camera to observe the behavior of the aquatic animal and to produce an alarm signal when the abnormal behavior of animal is observed, for predicting behavior).

In response to applicant's arguments that there is no motivation to combined Maki with Baba, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, combination of Maki with Baba provides monitoring particular behavior of the inhabitants in order to take action when abnormal behavior occurs, which can easily be implemented in an tracking device such as video camera.

Regarding claim 3, applicant argues in essence that Maki does not teach "an animal identification, segregation, and tracking module". Examiner disagrees and indicates (column 29, lines 23-28, receiving three-dimensional position

information on the individual feature (identification) points obtained at the three-dimensional position information extraction unit, the motion information detector causes the three-dimensional basic image calculator to synthesize the luminance of the feature point of target).

Regarding claim 8, applicant argues in essence that Maki does not teach, "classifying said changes in position and shape of said animal".

Contrary to the applicant's assertion, the examiner indicates that Shuster teaches, displaying various types of behaviors in animal, such as scratching, licking, drinking, eating, drooling, grooming, tail chasing and head shaking (column 3, lines 33-62).

Claim Rejections - 35 U.S.C. § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 and 6-7, are rejected under 35 U.S.C. 103(a) as being unpatentable over Maki et al (U.S.6, 072,903) in view of Baba et al (U.S. patent 4,888,703).

Regarding claim 1, Maki et al discloses a video-based animal behavior analysis system, comprising, a computer configured to determine a position and

shape of an animal from video images and characterize activity of said animal based on analysis of changes in said position and said shape over time (see column 15, lines 49-57, detecting information about position, shape and posture of object, also column 32, lines 56-67, to target object and "configured" to determine pixels corresponding, and position and posture of target, and column 24, line 63 through column 25, line11, described the motion of the object automatically or acquire information on the "position of the object or on the change of the posture", on the basis of the time-series images, and posture information detector 303, tracks the motion of the object automatically according to the position of the feature points).

However regarding claim 1, Maki clearly discloses a methodology for analyzing tracking object, and expressly discloses (column 18, line 62 through column 19, line 4on the basis of the difference between the central point at one time and that at another time, it is possible to determine information on the three-dimensional motion of the object between frames that is changes in the position of the posture of the object, but does not explicitly state, "one of a set of predetermined behaviors based on an analysis of changes in position or shape". On the other hand Baba teaches (column 2, lines 42-54, a television camera for taking an image of a predetermined area of the basin and a processor for processing the image taken by the camera to observe the behavior of the aquatic animal and to produce an alarm signal when the abnormal behavior of animal is observed, for predicting behavior).

Therefore it would have been obvious to a person of ordinary skill in the art at time the invention was made, to modify Maki et al invention according to the teachings of Baba because Maki and Baba combination form same filed of detect or tracking of objects motion (behavior), that provides monitoring particular behavior of the inhabitants in order to take action when abnormal behavior occurs, which can easily be implemented in an tracking device such as video camera.

Regarding claim 6, Maki et al discloses the system of claim 1, wherein said animal is a mouse (column 2, lines 20-26 refer to three dimensional mouse).

Regarding claim 7, recite similar limitation as claim 6 is similarly analyzed.

Claims 2-5, are rejected under 35 U.S.C. 103(a) as being unpatentable over Maki et al (U.S.6, 072,903) in view of Baba et al (U.S. patent 4,888,703) as applied to claims above and further in view of Yabusaki et al (U.S. patent 6, 715,444).

Regarding claim 2, Maki clearly discloses a video compression, however neither maki nor Baba explicitly state, "video digitization unit coupled to said computer for capturing said video images and converting said video images from analog to digital". On the other hand Yabusaki teaches, Fig. 1, breeding cage having a mouse, which after amplification of the signal thus detected by frequency analyzer and conversion of it into a digital signal (column 3, lines 38-54).

Therefore it would have been obvious to a person of ordinary skill in the art at time the invention was made, to modify Maki and Baba invention according to the teachings of Yabusaki because it provides desired accuracy and achieved more efficiency, which can easily be implemented in an images device such as digital still or video camera.

Regarding claim 3, Maki et al discloses the system of claim 2, further comprising, an animal identification, segregation, and tracking module receiving said video images (column 29, lines 23-28, receiving three-dimensional position information).

Regarding claim 4, Maki et al discloses the system of claim 3, wherein said computer further includes a behavior identification module for characterizing activity of said animal, said behavior identification module being coupled to said animal identification, segregation, and tracking module (see claim 3, also column 23, lines 37-51, the three-dimensional position and posture of the target object at each point).

Regarding claim 5, Maki et al discloses the system of claim 4, wherein said computer further includes a standard animal behavior storage module that stores information about known behavior of a predetermined standard animal for comparing the activity of said animal, said standard animal behavior storage module being coupled to said behavior identification module (see claim 4, also column 7, lines 19-33, memory for storing time-series images).

Claims 8-10, 12, 14-17, 19 and 21-55, are rejected under 35 U.S.C. 103(a) as being unpatentable over Maki et al (U.S.6, 072,903) in view of Baba et al (U.S. patent 4,888,703) as applied to claims above and further in view of Shuster et al (U.S.6, 242,456).

Regarding claim 8, Maki et al discloses a method of determining and characterizing activity of an animal-using computer processing of video images (column 23, lines 30-36, computer graphic);

comprising the steps of, detecting an animal in said video images; tracking changes to said animal over a plurality of said video images (see claim 1, also column 23, line 64 throw column 24, line 7, tracking of motion picture, also (see

column 3, lines 15-22, changes of image in different time, and also column 27, lines 20-31, comparison and synthesizing the images).

However neither Maki nor Baba explicitly state, "classifying changes in position and shape of animal as postures". On the other hand Shuster teaches, displaying various types of behaviors in animal, such as scratching, licking, drinking, eating, drooling, grooming, tail chasing and head shaking (column 3, lines 33-62).

Therefore it would have been obvious to a person of ordinary skill in the art at time the invention was made, to modify Maki and Baba invention according to the teachings of Shuster because it provides a method for detecting and treating compulsive behaviors in animals which can easily be implemented in an images device such as digital still or video camera.

Regarding claim 9, Maki et al discloses the method of claim 8, wherein said step of characterizing said activity includes the steps of: describing a sequence of postures as behavior primitives; and aggregating behavior primitives into actual behavior over a range of images (see claim 1, column 22, lines 56 through column 23, line 7, estimation range of distance using three-dimensional position).

Regarding claim 10, Maki et al discloses the method of claim 9, wherein said step of characterizing said activity by describing and aggregating behavior primitives further includes the steps of, describing a set of conditions and rules required for characterizing said activities, and matching and testing generated features to see if said conditions and rules are satisfied (column 4, lines 18-37, matching and estimates the distance information on the basis of the evaluation).

Regarding claim 12, Maki et al discloses the method of claim 10, wherein said posture determination and description includes using statistical and contour-based shape information (column 9, lines 14-27, determining points of contours).

Regarding claim 14, Maki et al discloses the method of claim 12, wherein said step of identifying and classifying changes to said animal uses contour-based shape information selected from the group consisting of curvature measures, thickness measures, relative orientation measures, length measures, and corner points (column 9, lines 14-23, refer to connected feature points, such as outer corner of the eye).

Regarding claim 16, Maki et al discloses the method of claim 15, wherein said step of identifying and classifying changes to said animal includes classifying the statistical and contour-based shape information from a current image to assign a best-matched posture (see claim 14, also column 4, lines 19-35, degree of matching).

Regarding claim 17, Maki et al discloses the method of claim 10, wherein the said step of describing said behavior primitives includes the step of identifying patterns of postures over a sequence of images (column 3, line 63 through column 4, line 17, change of the position and posture of the target in the time series images).

Regarding claim 19, Maki et al discloses the method of claim 10, wherein the said step of determining actual behavior by aggregating behavior primitives includes the step of analyzing temporal ordering of the primitives, such as using information about a transition from a previous behavior primitive to a next behavior primitive, and applying all applicable conditions and rules (column 8, lines 9-25, previous and current images).

Regarding claim 21, Maki et al discloses the method of claim 19, wherein the said step of determining actual behavior includes identifying actual behavior selected from a group of pre-trained behavior models (Fig. 18, column 7, lines 10-25, model of moving object).

Regarding claim 28, Maki et al discloses the method of claim 21, wherein said group of behavior models includes the behavior of jumping, and said jumping behavior is determined by a single up and down movement of the animal (column 2, lines 46-52, model of a moving object).

Regarding claim 33, Maki et al discloses the method of claim 21, wherein said group of behavior models includes the behavior of sleeping, and said sleeping behavior is determined by the absence of major movements of the contour of the animal for a prolonged period of time (column 9, lines 14-26, the upper and lower contour).

Regarding claim 39, Maki et al discloses the method of claim 21, wherein said group of behavior models includes the behavior of turning, and said turn behavior is determined by a sequence of postures starting from horizontal side view or cuddled posture to ending in a horizontal front/back view posture, and vice versa (column 25, lines 6-11 posture information).

Regarding claim 48, Maki et al discloses the method of claim 8, wherein said step of detecting animal includes the step of detecting body parts of the animal (column 15, lines 49-63, detect information on the distance to the object and shape according to the position and posture).

With regard to claims 15, 22-27 and 29-32, the arguments analogous to those presented for claims 8 and 16, is applicable.

Regarding claims 34-38 and 40-47 and 49-55, recite similar limitation as claim 15 are similarly analyzed.

Claim 20, is rejected under 35 U.S.C. 103(a) as being unpatentable over Maki et al (U.S.6, 072,903) in view of Baba et al (U.S. patent 4,888,703) as applied to claims above and further in view of Smith et al (U.S.5, 870,138).

Regarding claim 20 Maki and Baba fails to disclose "Hidden Markov Model (HMMs). On the other hand Smith et al teaches, neural network or Hidden Markov Model and has two phases of operation, namely training and recall to map the input images from camera to outputs which represents the probability of the input images (column 17, lines 41-55).

Therefore it would have been obvious to a person of ordinary skill in the art at time the invention was made, to modify Maki and Baba invention according to the teachings of Smith et al because it provides signal processing techniques to map the input data (images) from the camera to outputs which represents the probability of the input images belonging to a specified set of expressions, that can easily be implements in an images device for better result and greater accuracy such video surveillance or monitoring system.

Allowable claim

4. Objected claims 11, 13 and 18 are allowed. Because it is rewritten in independent form including all of the limitation of the base claim and any intervening claims.

Other prior art cited

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. patent (6,715,444) to Yabusaki et al is cited for method and device for measuring frequency of specific behavior of animal.

U.S. patent (6,630,347) to Huang et al is cited for endothelial nos transgenic animal and method of use.

U.S. patent (6,630,148) to Ingham et al is cited for compositions comprising hedgehog proteins.

U.S. patent (6,576,237) to Ingham et al is cited for vertebrate tissue pattern-inducing proteins and uses related thereto.

Conclusion

6. **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (571) 272-7443. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu, can be reached at (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR. Status information about the PAIR system, see http:// pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seyed Azarian
Patent Examiner
Group Art Unit 2624
May 29, 2006

JINGGE WU
PRIMARY EXAMINER